SUPER LAB™

FS2000

Service Manual

KAWAI Kawai Musical Instruments
Manufacturing Co., Ltd.

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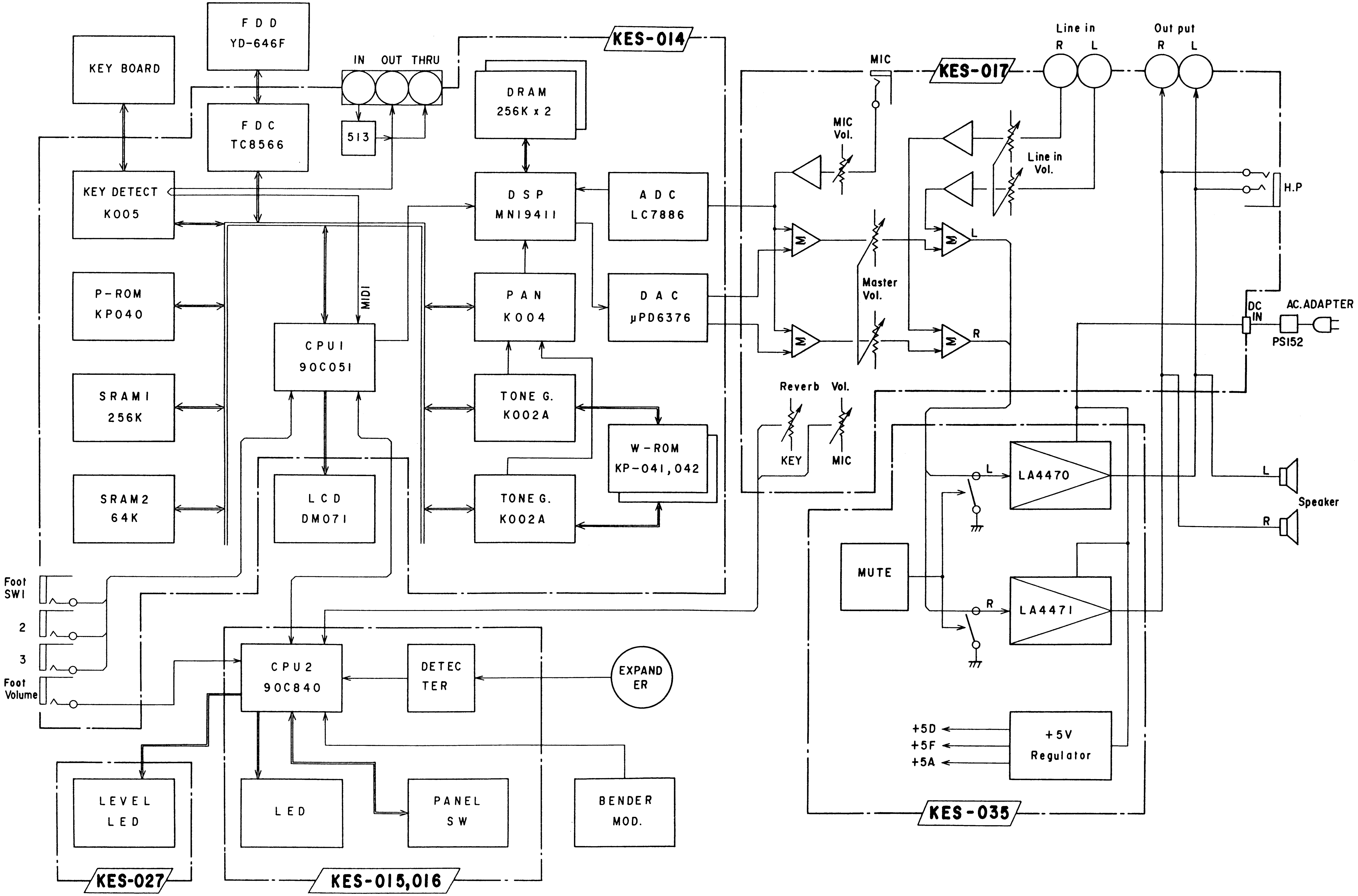
1. P.W.B INFORMATION

P.W.B No.	Description
KES-014	CPU, Tone Generator, DAC, RAM, ROM
KES-015	Panel Switch Matrix, LED
KES-016	Panel Switch Matrix
KES-017	Low-Pass Filter, Line In, Mic, DC In, Power Switch, Headphone Jack Line Out, Volume Slider
KES-027	LED
KES-035	Amp., Power Supply

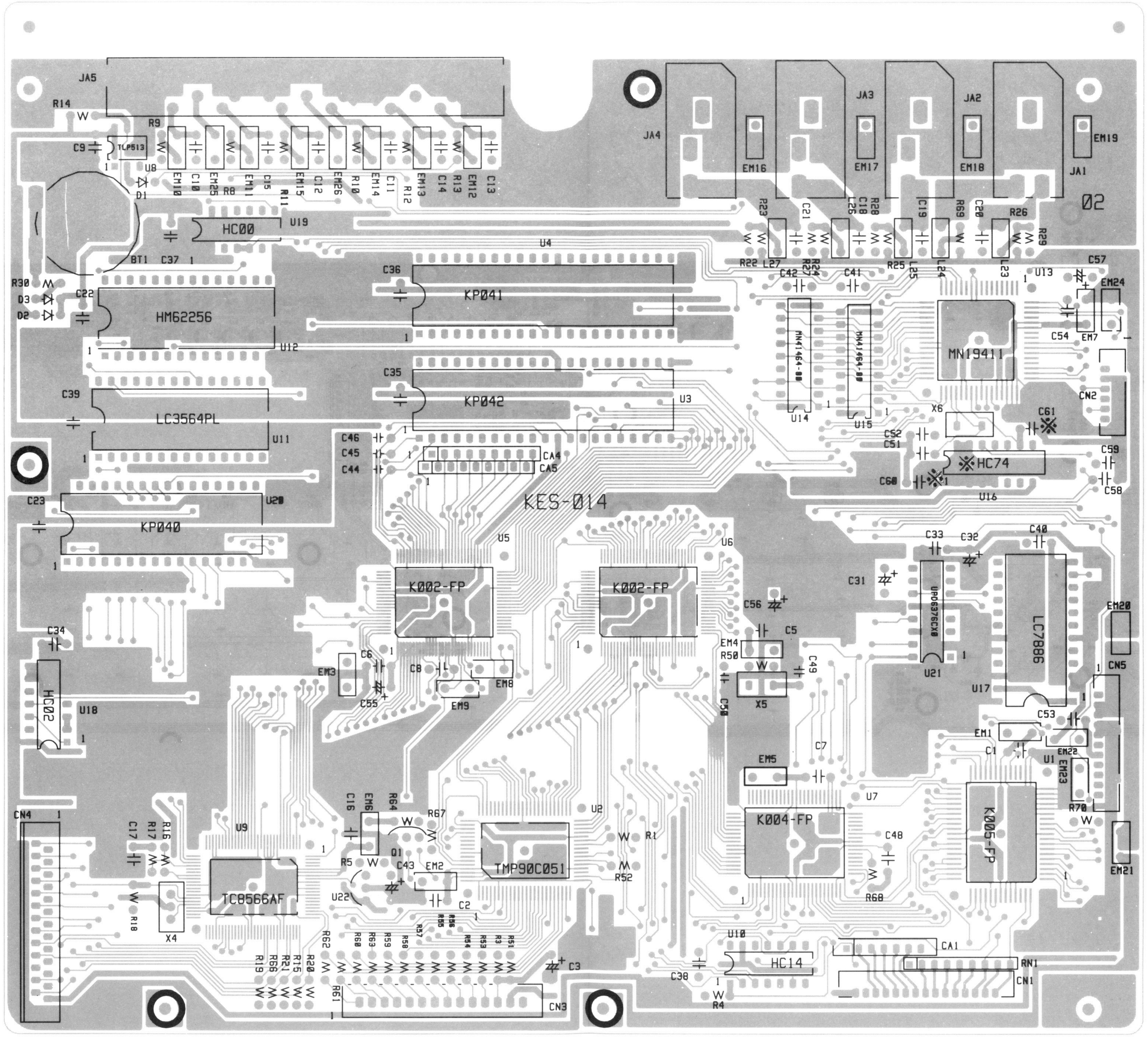
2. SEMICONDUCTORS LIST

	Name	Description
IC	TC74HC00	HCMOS Logic IC
	TC74HC02	HCMOS Logic IC
	TC74HC14	HCMOS Logic IC
	TC74HC74	HCMOS Logic IC
	TMP90C051	CPU
	TMP90C840AF	CPU
	K002A-FP	Tone Generator
	K004-FP	Panpot Controller
	K005-FP	Key Touch Controller
	LC7886	ADC
	μPD6376CX	DAC
	MN19411	DSP
	TC8566AF	FDC
	KP040-M8DP	4M bit ROM
	KP041-M9DW	8M bit ROM
	KP042-M9DW	8M bit ROM
	μPD43256-10LL	256K bit RAM
	LC3564PL-10	64K bit RAM
	MN41464A-08	256K bit DRAM
	PST529F	RESET IC
	TLP513	Photo Coupler
	TA75358P	Op amp
	AN7805F	+5V Regulator
	LA4470	Power Amplifier
	LA4471	Power Amplifier
	TC4066BP	Analog switch
	IR9393	Comparator
	HA17558	Op amp

3. BLOCK DIAGRAM



4. KES-014 PRINTED WIRING BOARD



(※) marked parts are mounted externally in the FS-2000 of the following serial numbers.
650001～650234 650425～650430 650541～650548 650471～650490 651335～651336

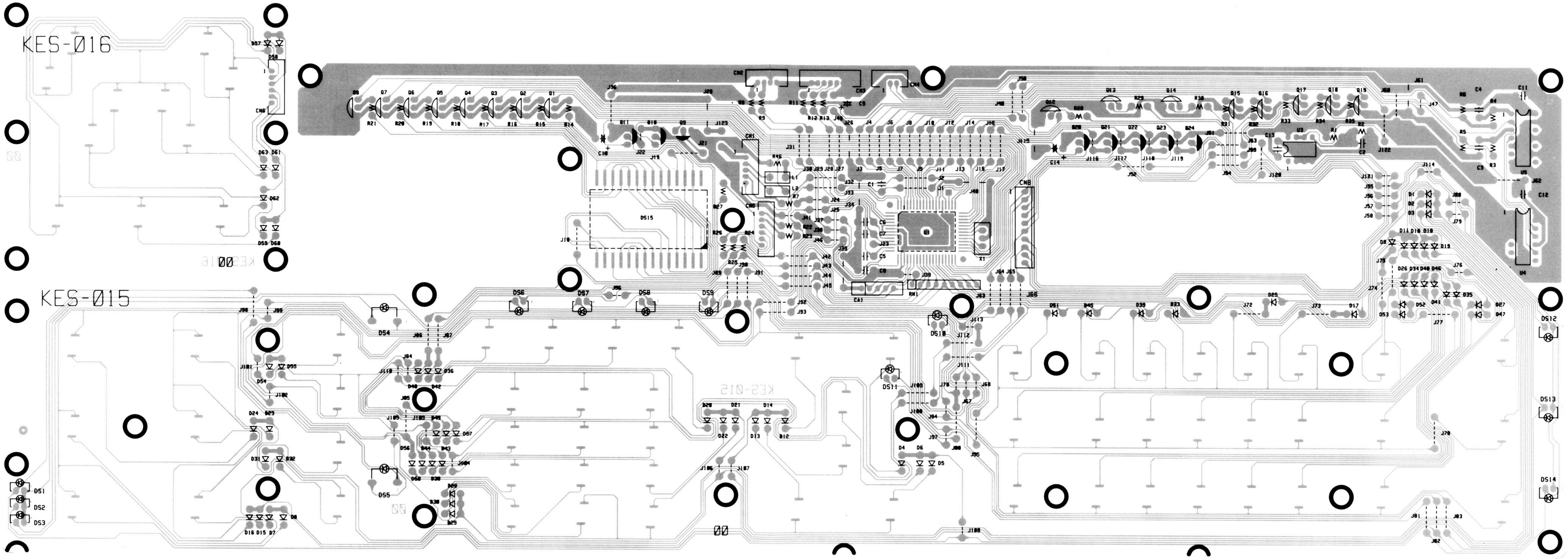
A B C D E F G H I

1

5. KES-015 PRINTED WIRING BOARD

2

3



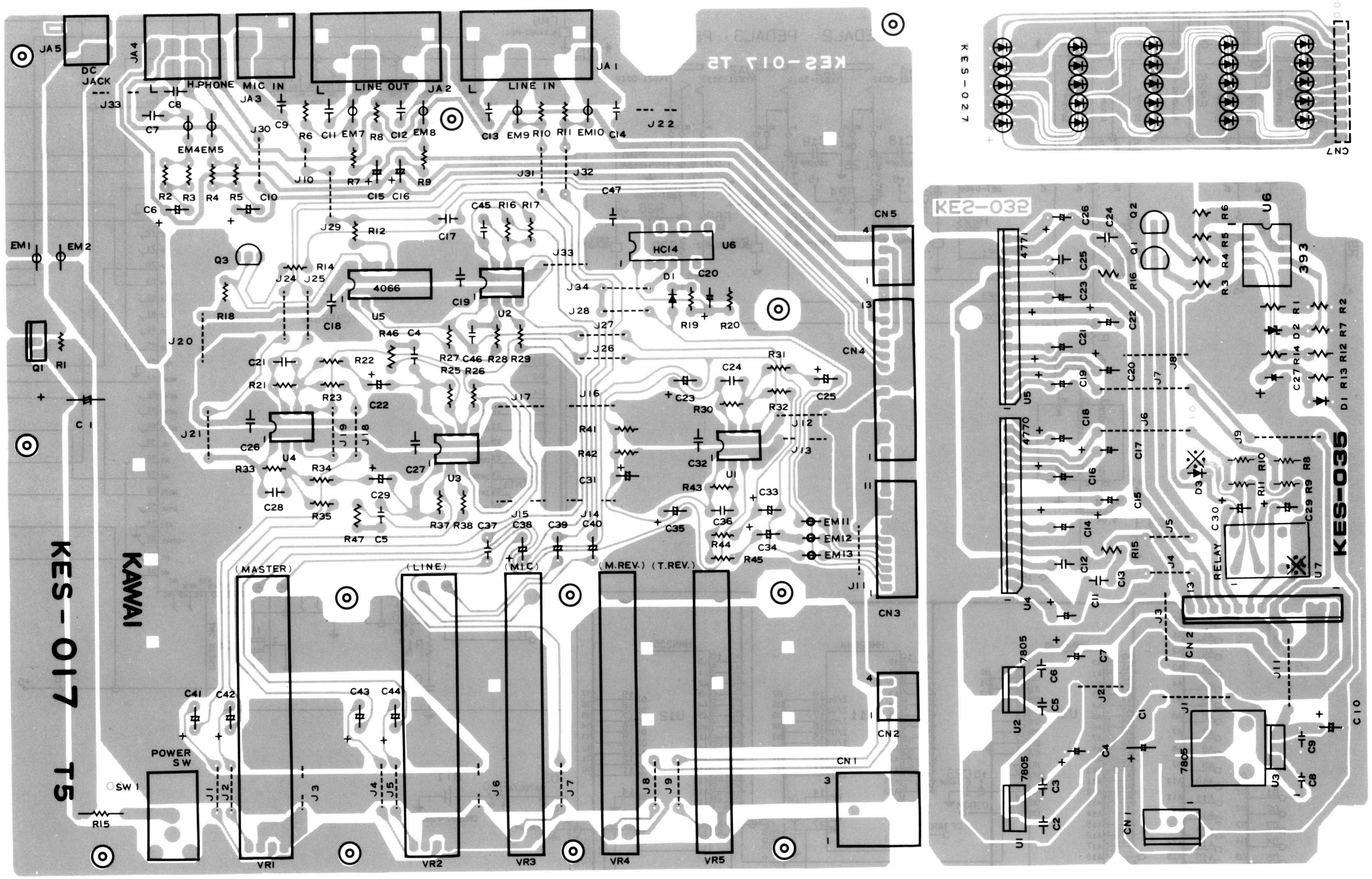
4

5

6

7

6. KES-017, 035, 027 PRINTED WIRING BOARD

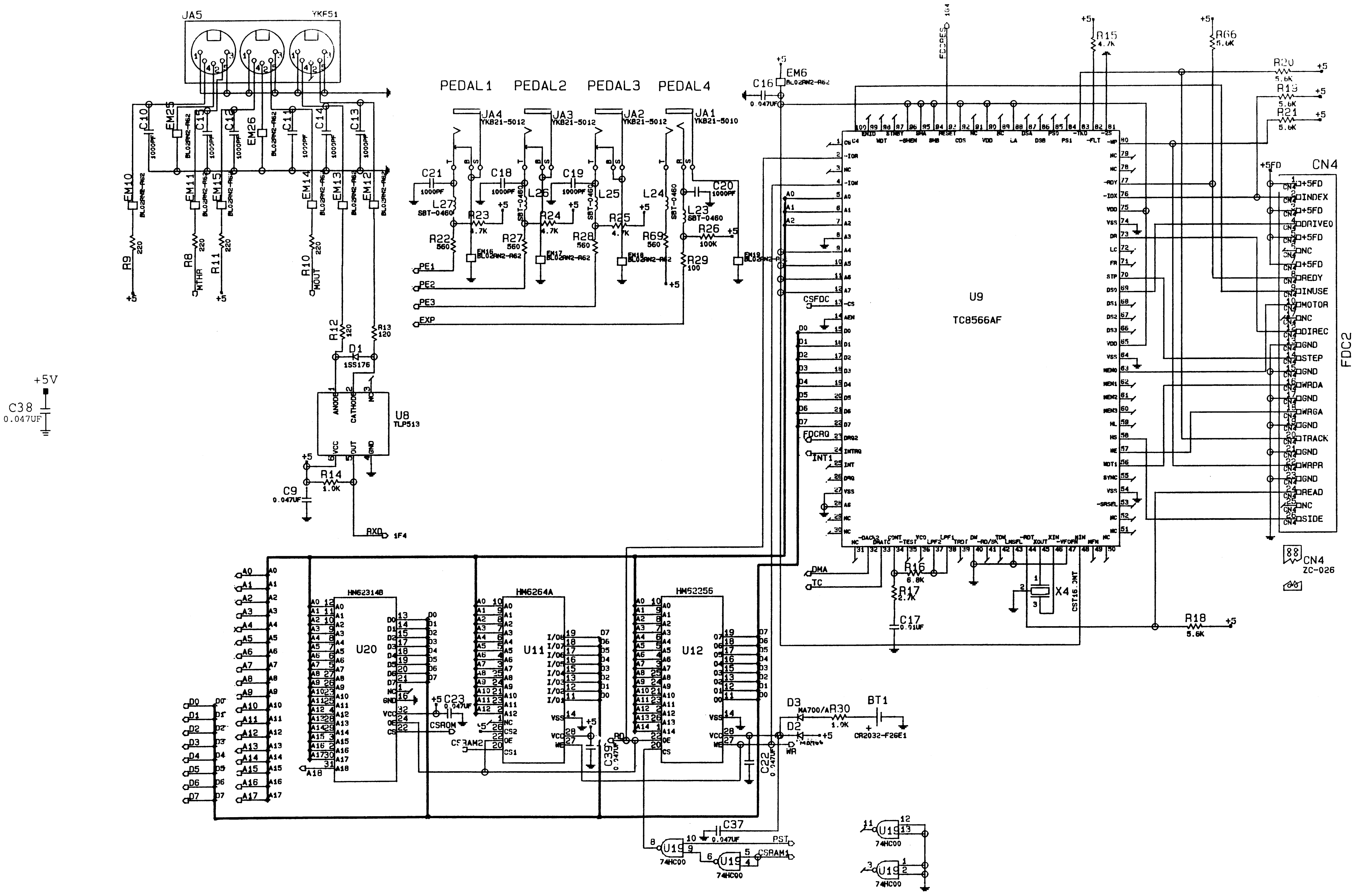


(※) marked parts are mounted externally in the FS-2000 of the following serial numbers.

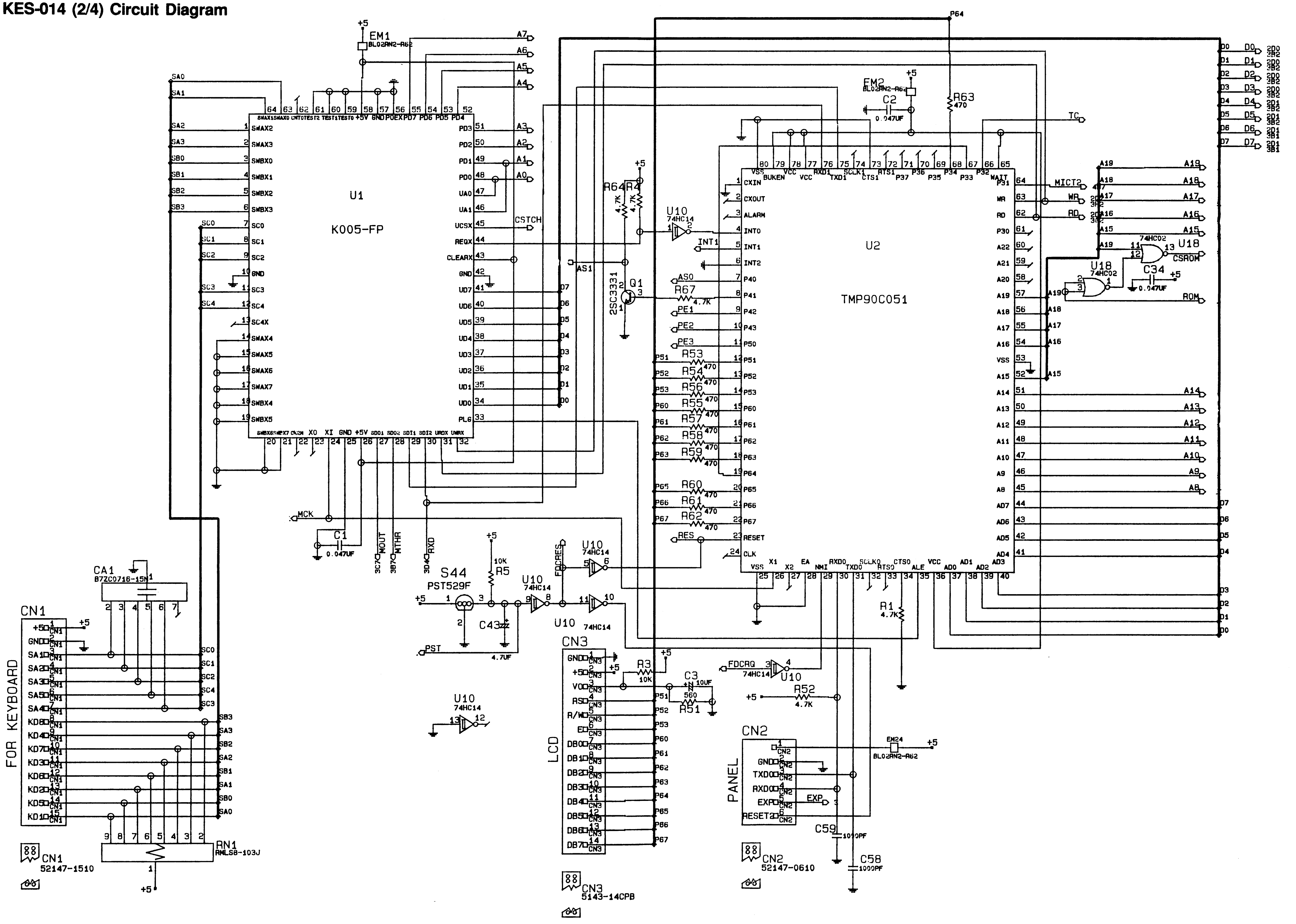
650001~650234 650425~650430 650541~650548 650471~650490 651335~651336

7. KES-014 CIRCUIT DIAGRAM

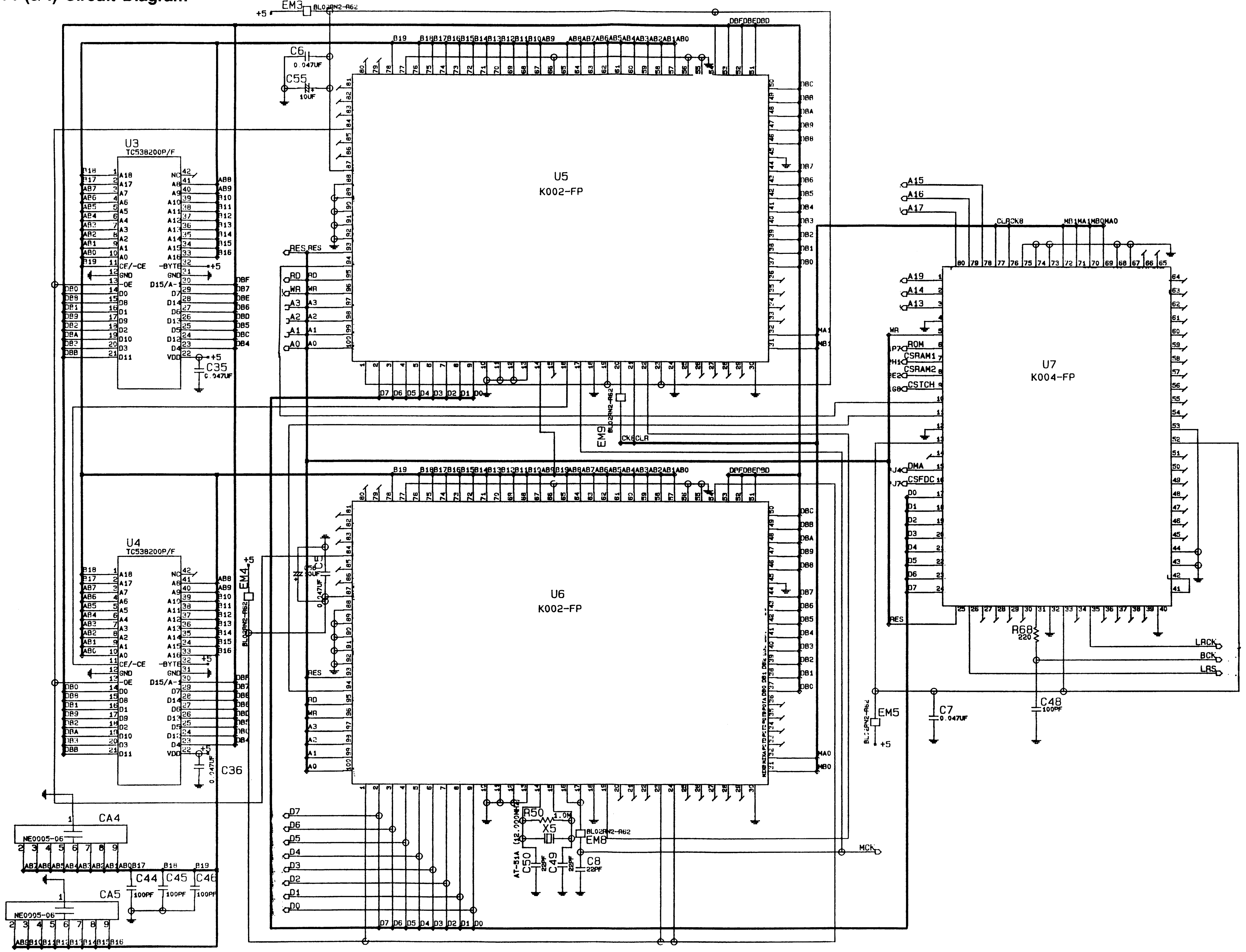
7-1. KES-014 (1/4) Circuit Diagram



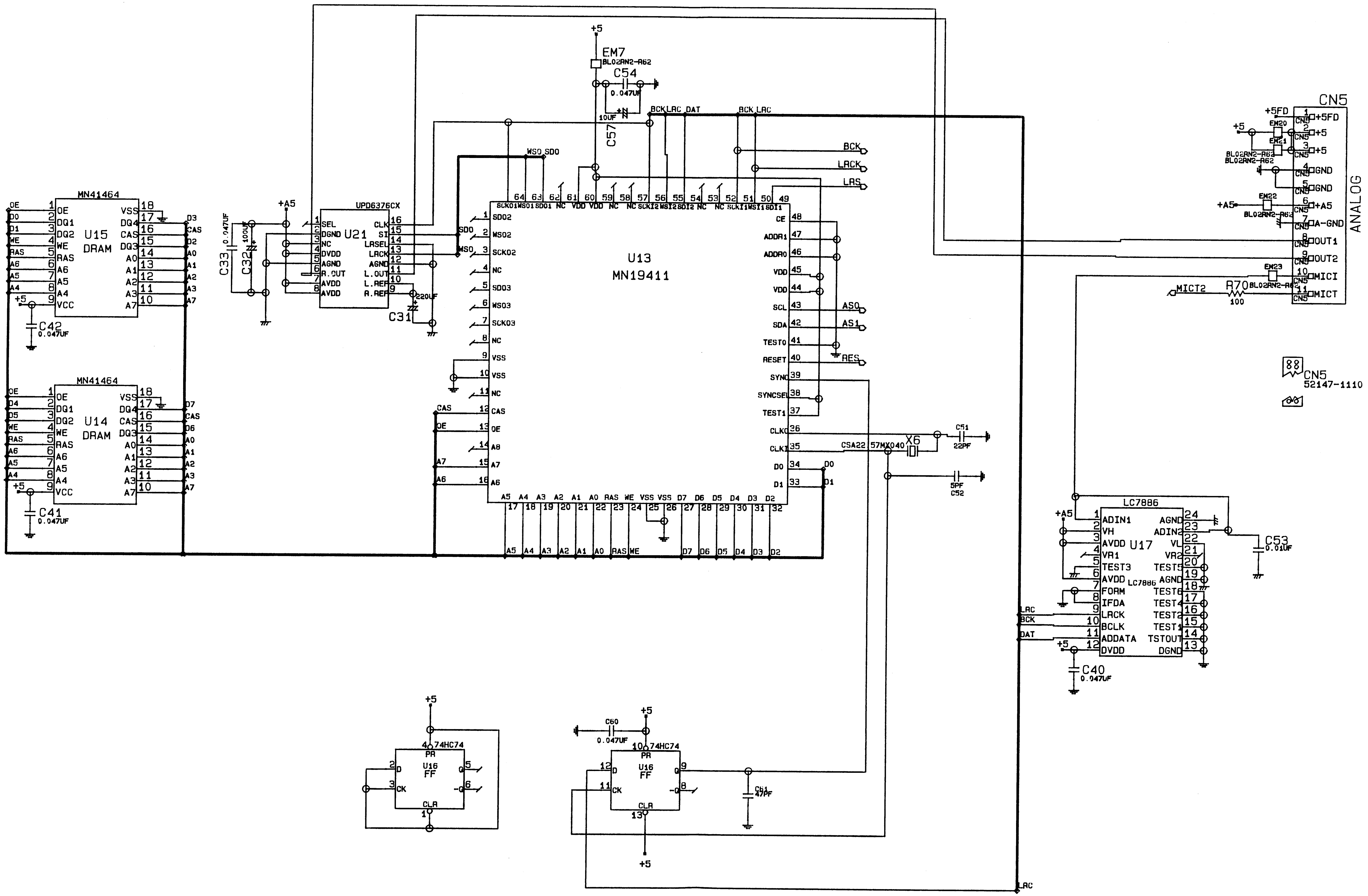
7-2. KES-014 (2/4) Circuit Diagram



7-3. KES-014 (3/4) Circuit Diagram

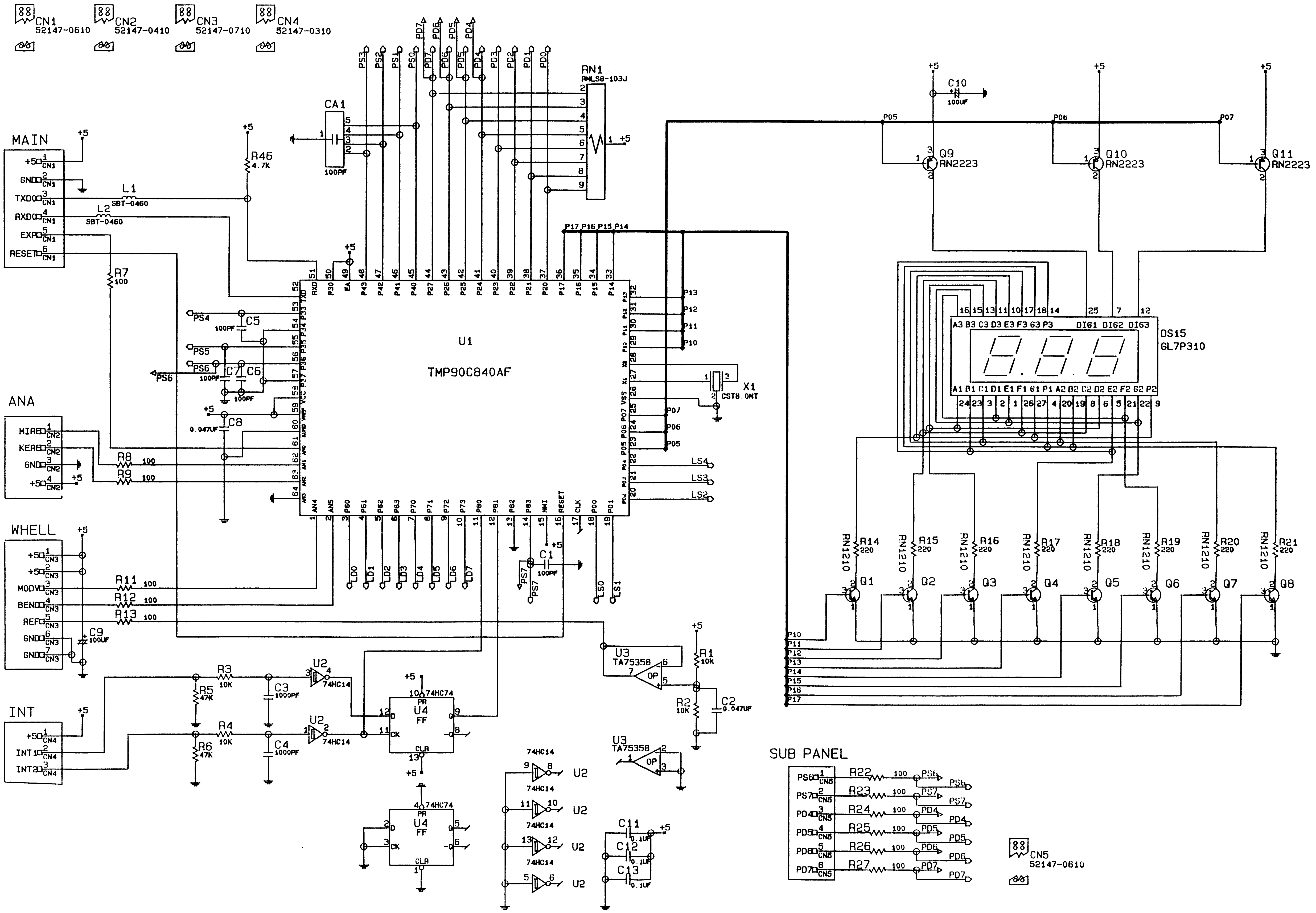


7-4. KES-014 (4/4) Circuit Diagram

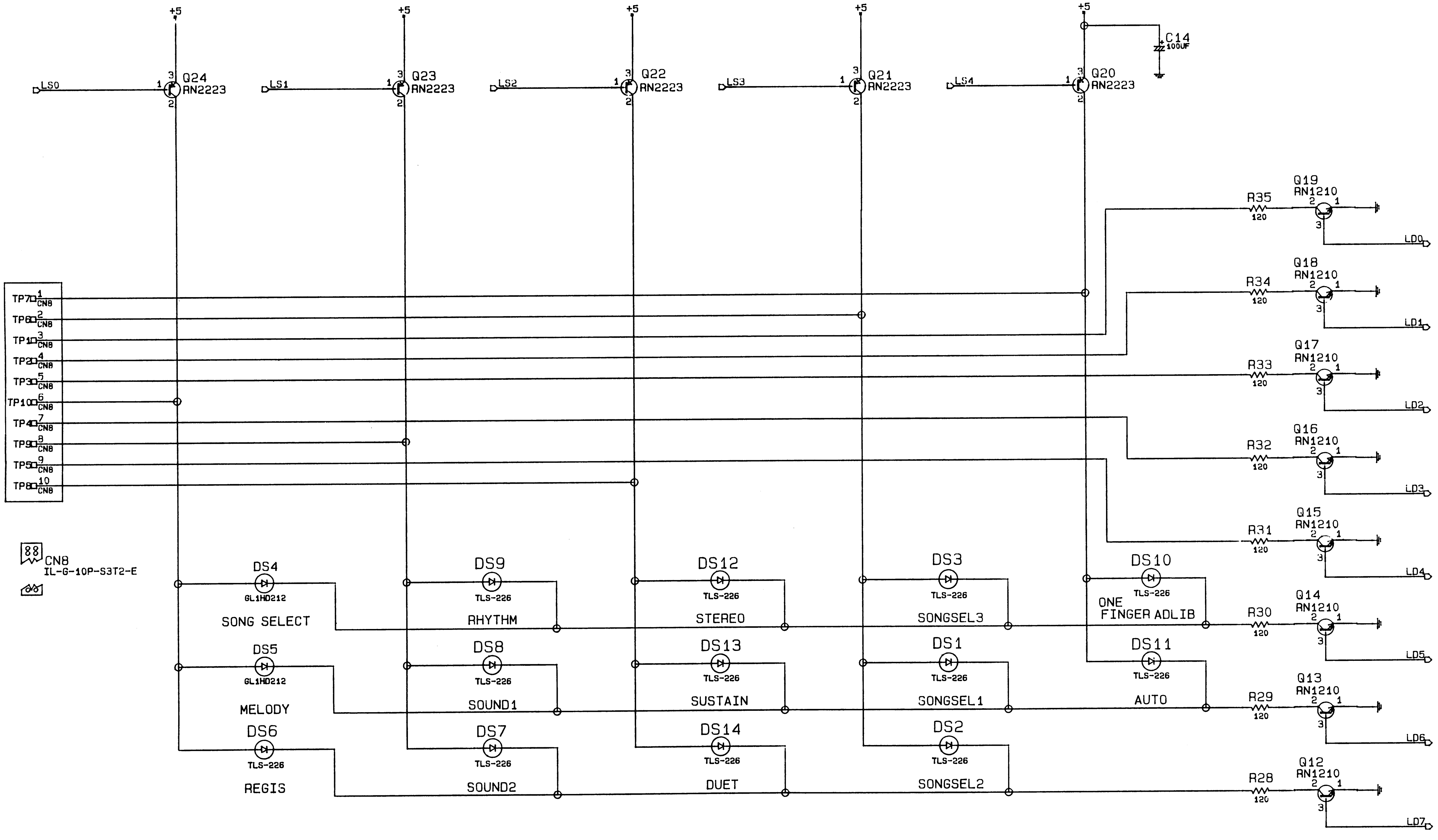


8. KES-015 CIRCUIT DIAGRAM

8-1. KES-015 (1/3) Circuit Diagram



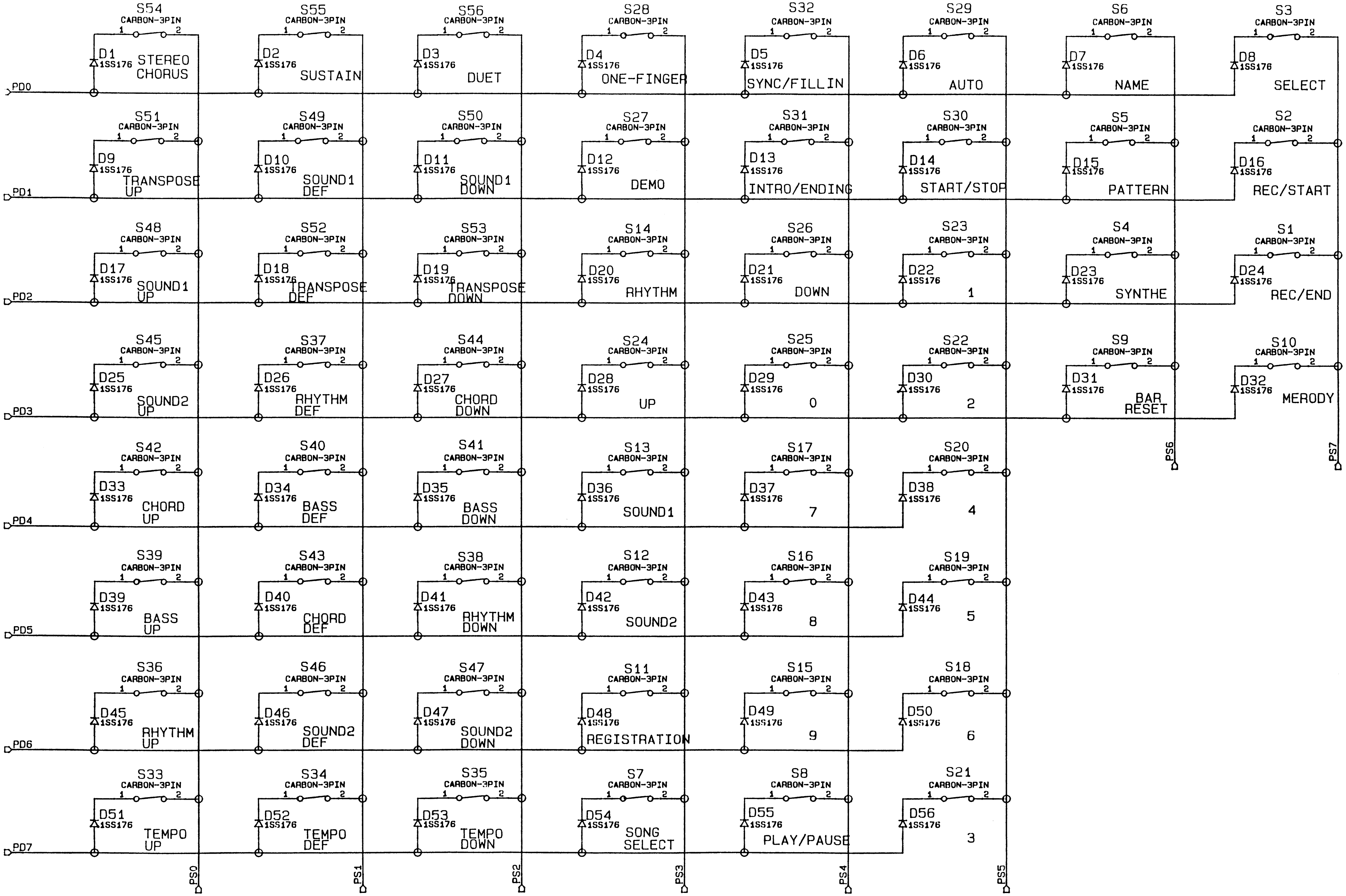
8-2. KES-015 (2/3) Circuit Diagram



A B C D E F G H I

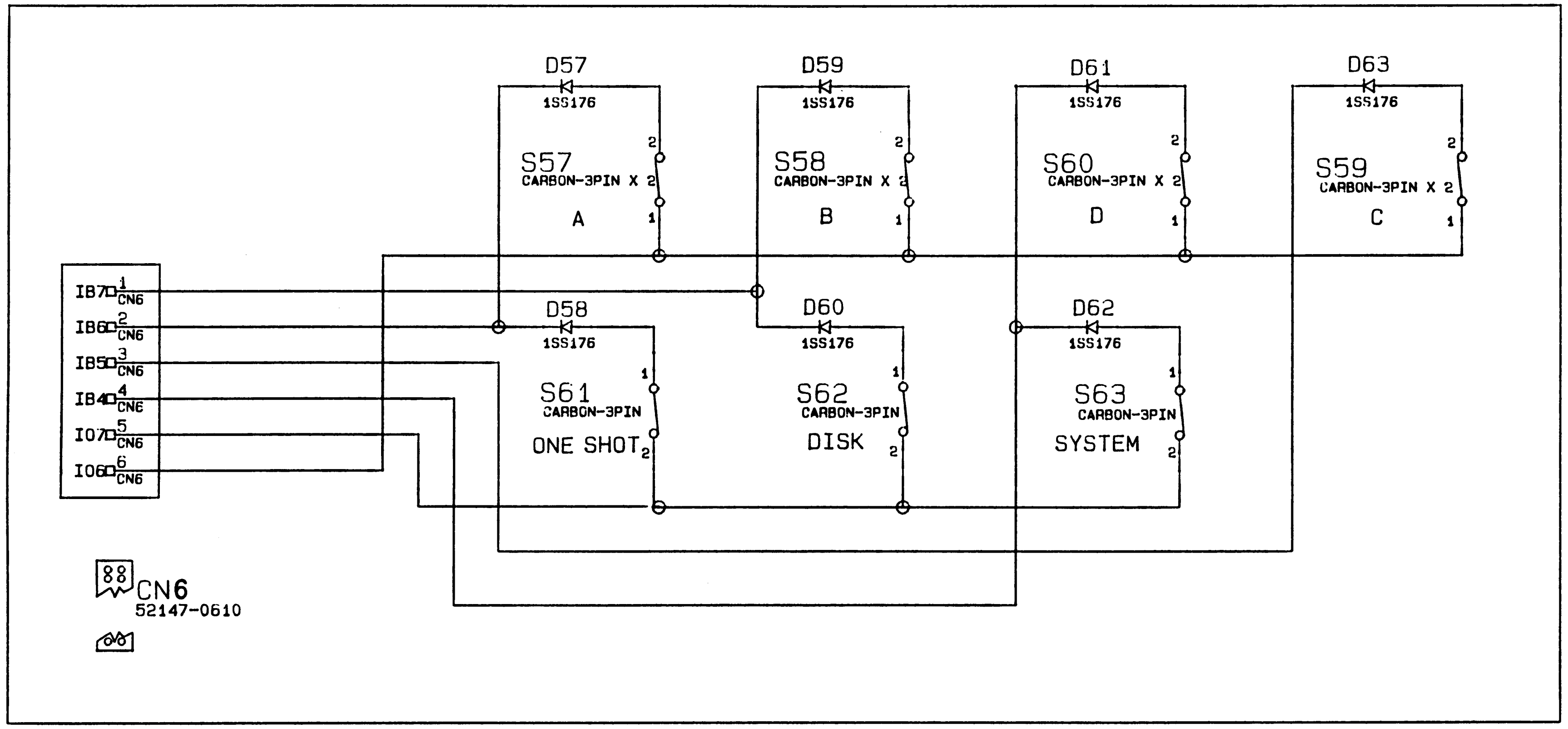
1 2 3 4 5 6 7

8-3. KES-015 (3/3) Circuit Diagram

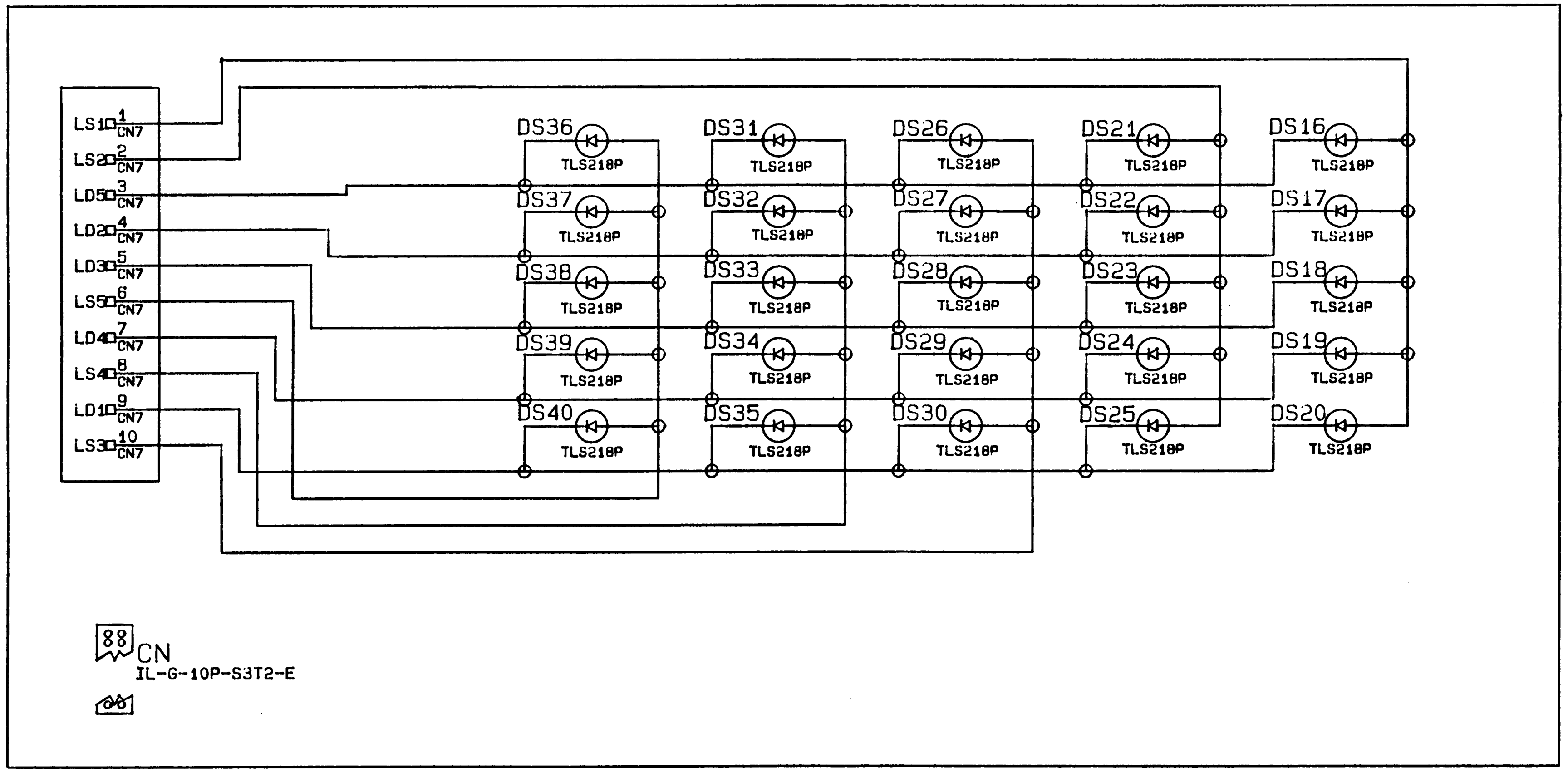


9. KES-016, KES-027 CIRCUIT DIAGRAM

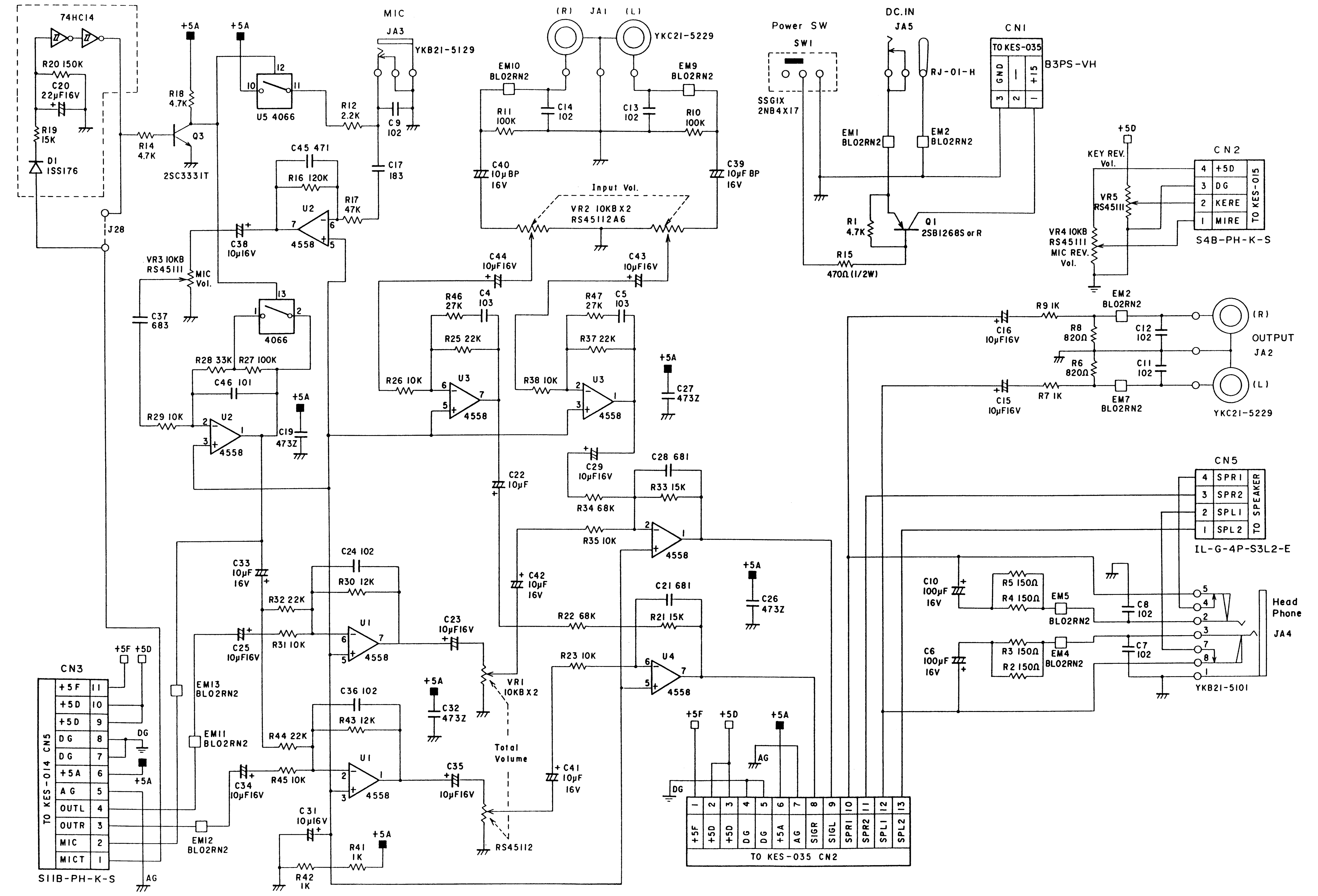
KES-016



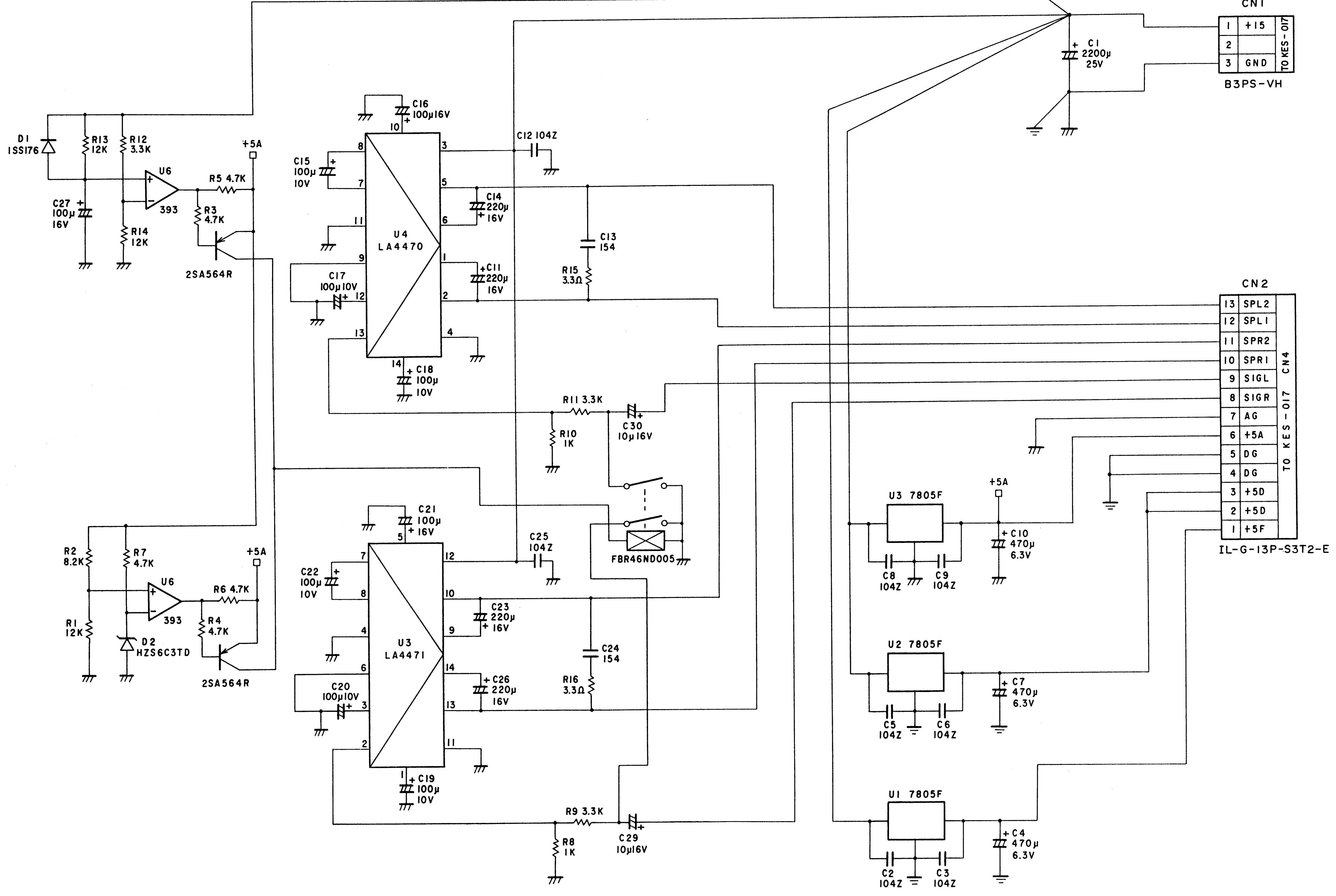
KES-027



10. KES-017 CIRCUIT DIAGRAM



11. KES-035 CIRCUIT DIAGRAM



12. TROUBLESHOOTING

TROUBLE	CHECK	CAUSE	REPAIR
No sound	• AC adaptor or batteries	• Exausted batteries or defective AC adaptor	• Replace the battery or AC adaptor
	• Foils around the DC jack (KES-017)		
	• Open-circuited foil	• Repair the broken foil	
	• Voltage Regulator(AN7805F on KES-017) pin 3 (should be 5V)	• Faulty AN7805F • Open or Short-circuited foil	• Replace AN7805F • Repair the foil
	• Oscillator X5(KES-014)	• Faulty Oscillator (X5)	• Replace X5
	• Connections between the P.W.B's	• Loose connector • Open-circuited wire	• Insert connector firmly • Repair the connection
	If all the aboves are OK, a digital device may be faulty. In such a case, replace the P.W.B. (KES-014)		
Abnormal sound	• Power amplifier (LA4470, 4471 KES-035)	• Faulty Power amplifier	• Replace LA4470, LA4471
	• DAC (µPD6376CX : KES-014) pin 13 ; 125KHz clock pulse pin 16 ; 3MHz clock pulse pin 15 ; 3MHz clock puse (Observed only when the keyboard produces sounds) pins 6 & 11 ; sound signal	• Faulty DAC	• Replace µPD6376CX
	• Speakers	• Faulty speaker	• Replace speaker
	• Headphone Jack	• Faulty headphone jack	• Replace headphone jack
LED or switch does not work	• P.W.B (KES-015,016, 027) foils	• Open-circuited foil	• Repair the foil
	• Rubber contact (KES-015,016)	• Dirt or dust on the contact • Deteriorated rubber	• Clean the contact • Replace the rubber
	• Diode (KES-015,016,027)	• Faulty diode	• Replace the diode
	• Harness between KES-014 and KES-015	• Open-circuited wire • Poor contacted harness	• Repair the wire • Repair the harness
No MIDI function	• Photo coupler (TLP513: KES-014)	• Faulty photo coupler	• Replace TLP513
	• DIN connectors	• Faulty DIN connector	• Replace DIN connector
	• K005	• Faulty IC	• Replace K005
Defect in Keyboard	• Rubber contact	• Dirt or dust on the contact • Deteriorated rubber	• Clean the contact • Replace the rubber
	• P.W.B foils	• Open-circuited foil	• Repair the foil
	• Wiring	• Open-circuited wire	• Repair the wiring
Defect in Jack	• P.W.B foil	• Open-circuited foil	• Repair the foil
	• Jack	• Faulty jack	• Replace the jack
FDD does not work properly	• TC8566AF(FDC)	• Faulty TC8566AF	• Replace TC8566AF
	• Connector of the FDD unit	• Poor contacted connector	• Repair or replace connector
LCD does not work	• LCD	• Faulty LCD	• Replace the LCD
	• Connector of the LCD unit	• Poor contacted connector	• Repair or replace connector

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